Total solder points: 83
Difficulty level:
beginner 1☐ 2☑ 3☐ 4☐ 5☐*advanced*

HIGH-Q velleman-kit

15 Channel infrared transmitter

K4101 / K6710

Features and specifications :

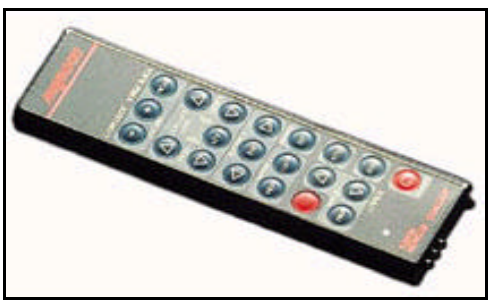
- ☑ Tactile Keyboard.
- ☑ Complete with aluminium Housing.
- ☑ Transmitter carrier wave frequency : 38KHz.
- ☑ Number of identification codes : 6
- ☑ 15 independent channels.
- ☑ Standby current consumption : 0.1 µA.
- ☑ Average current consumption during transmission : 10mA.

Works together with :

- K6711 - 15 Channel infrared receiver.
- K6712/13 One Channel infrared receiver.
- K4100 Digital controlled preamplifier.
- K4500 digital synthesizer FM tuner.

- ☑ Power supply : 9V Battery (not included).
- ☑ Dimensions : 50 x 23 x 175mm (2" x 0,9" x 6,9").

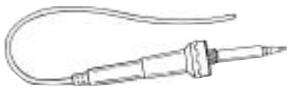
Modification reserved



VELLEMAN Components NV
Legen Heirweg 33
9890 Gavere
Belgium
http://www.velleman.be

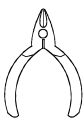
1. Assembly (Skipping this can lead to troubles !)
Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.

1.1 Make sure you have the right tools:

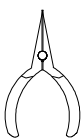


- A good quality soldering iron (25-40W) with a small tip.
- Wipe it often on a wet sponge or cloth, to keep it clean; then apply solder to the tip, to give it a wet look. This is called 'thinning' and will protect the tip, and enables you to make good connections. When solder rolls off the tip, it needs cleaning.

- Thin raisin-core solder. Do not use any flux or grease.

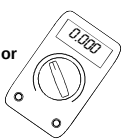


- A diagonal cutter to trim excess wires. To avoid injury when cutting excess leads, hold the lead so they can not fly towards the eyes.



- Needle nose pliers, for bending leads, or to hold components in place.
- Small blade and Phillips screwdrivers. A basic range is fine.

For some projects, a basic multi-meter is required, or might be handy



1.2 Assembly Hints :

⇒ Make sure the skill level matches your experience, to avoid disappointments.

⇒ Follow the instructions carefully. Read and understand the entire step before you perform each operation.

⇒ Perform the assembly in the correct order as stated in this manual

⇒ Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.

⇒ Values on the circuit diagram are subject to changes.

⇒ Values in this assembly guide are correct*

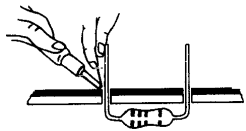
⇒ Use the check-boxes to mark your progress.

⇒ Please read the included information on safety and customer service

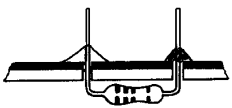
* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

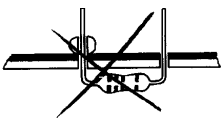
1.3 Soldering Hints :

Mount the component against the PCB surface and carefully solder the leads

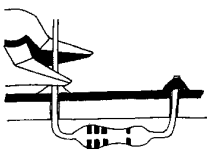


Make sure the solder joints are cone-shaped and shiny

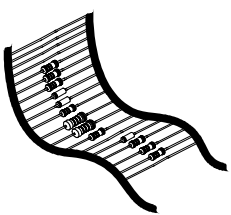




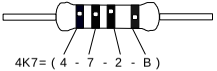
Trim excess leads as close as possible to the solder joint

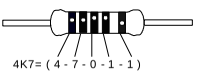


AXIAL COMPONENTS ARE TAPED IN THE CORRECT MOUNTING SEQUENCE !



REMOVE THEM FROM THE TAPE ONE AT A TIME !

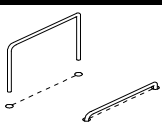




CODE	I CODICE COLORE	P CODIGO DE CORES	E CODIGO DE COLORES	SF VÄRI KOODI	S FÄRG SCHEMA	DK FARVE-KODE	N FARGE-KODE	D FARB KODE	GB COLOUR CODE	F CODIFICATION DES COULEURS	NL KLEUR KODE	CODE
0	Nero	Preto	Negro	Musta	Svart	Sort	Sort	Schwarz	Black	Noir	Zwart	0
1	Marrone	Castanho	Marrón	Ruskea	Brun	Brun	Brun	Braun	Brown	Brun	Bruin	1
2	Rosso	Encarnado	Rojo	Punainen	Röd	Rød	Rød	Rot	Red	Rouge	Rood	2
3	Aranciato	Laranja	Naranjado	Oranssi	Orange	Orange	Orange	Orange	Orange	Orange	Oranje	3
4	Giallo	Amarelo	Amarillo	Keltainen	Gul	Gul	Gul	Gelb	Yellow	Jaune	Geel	4
5	Verde	Verde	Verde	Vihreä	Grön	Grøn	Grønn	Grün	Green	Vert	Groen	5
6	Blu	Azul	Azul	Sininen	Blå	Blå	Blå	Blau	Blue	Bleu	Blauw	6
7	Viola	Violeta	Morado	Purppura	Lila	Violet	Violet	Violet	Purple	Violet	Paars	7
8	Grigio	Cinzento	Gris	Harmaa	Grå	Grå	Grå	Grau	Grey	Gris	Grijs	8
9	Bianco	Branco	Blanco	Valkoinen	Vit	Hvid	Hvidt	Weiss	White	Blanc	Wit	9
A	Argento	Prateado	Plata	Hopea	Silver	Sølv	Sølv	Silber	Silver	Argent	Zilver	A
B	Oro	Dourado	Oro	Kulta	Guld	Guld	Guldl	Gold	Gold	Or	Goud	B

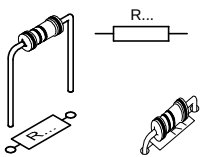
This infrared transmitter can be used to remotely operate our preamplifier (K4100) or tuner (K4500). More over it can be used together with the universal 15-channel receiver (K6711) and/or the one-channel receivers (K6712/13). For use with those last two kits, the transmitter has a universal keyboard, one of its keys even allows you to reset all the outputs at once. Another so-called safety key allows you to preserve the memory content (or stations in the case of the tuner), in order to avoid unwanted overwriting. Not only its possibilities but also the aluminium housing and a special VELLEMAN tactile keyboard make this Build-it-yourself remote control unique.

1. Jump Wire



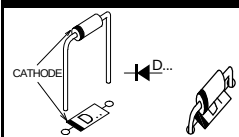
❑ J

2. Resistors



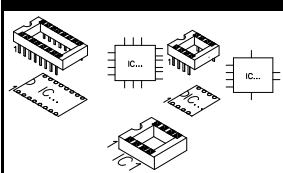
❑ R1 : 1K8 (1-8-2)
❑ R2 : 1K (1-0-2)
❑ R3 : 33 (3-3-0)
❑ R4 : 68 1/2W (6-8-0)
❑ R5 : 1 1/2W (1-0-B)

3. Diodes. Watch the polarity !



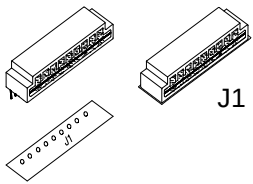
❑ D1 : 1N4148 or eq.
❑ D2 : 1N4148 or eq.

4. IC socket, *Watch the position of the notch !*



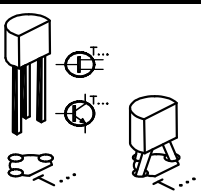
❑ IC1: 20P.

5. PCB cable connector



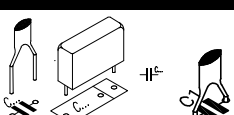
- ❑ J1

6. Transistors



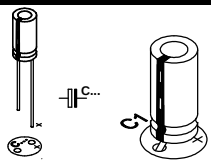
- ❑ T1: BC547 or eq.
- ❑ T2: BC640 or eq.

7. Capacitors.



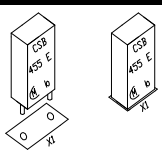
- ❑ C1 : 100 pF (101)
- ❑ C2 : 220 pF (221)

8. Electrolytic Capacitors. (Watch the polarity !)



- ❑ C3 : 10µF
- ❑ C4 : 470µF
- ❑ C5 : 470µF

9. Resonator.



- ❑ X1: 455KHz

10. Mounting the IR diodes. Watch the polarity !

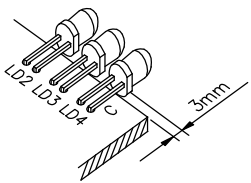


FIG 1.0

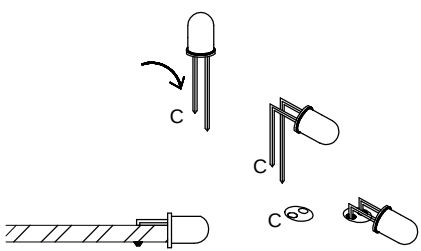
Fit the IR diodes LD2 trough LD4 (see fig. 1.0) horizontally and in line with the pcb. Pay attention to the polarity. Pass the shortest lead trough the hole marked C all like LD4.

First: Bend the leads exactly like the drawing.

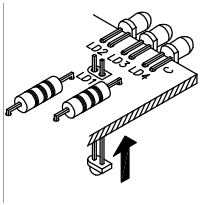
Next: Solder **one** lead, and check the position, if necessary correct by heating the soldering.

Last: Solder the second connection.

- ❑ LD2
- ❑ LD3
- ❑ LD4



11. Mounting the LED . Watch the polarity !



IMPORTANT
Fit LED LD1 at the solder side, AGAINST the PCB (see fig. 2.0a)

FIG 2.0a

First carefully bend its leads at the component side, in such a way as to make the longest lead (anode) touch R5 and the shortest lead touch R3.

After that you can solder the leads to the resistors and cut the free ends. (See Fig. 2.0b)

- ❑ LD1

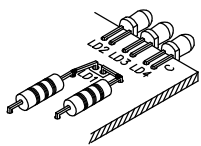


FIG 2.0b

12. Battery.

Connect the connection wires of the battery holder to the + (red wire) and the - (black wire) of the pcb. (see fig 3.0)

- ❑ Red
- ❑ Black

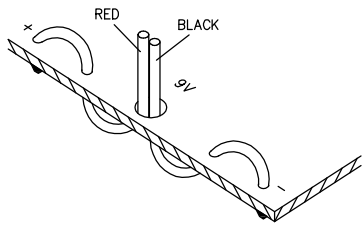
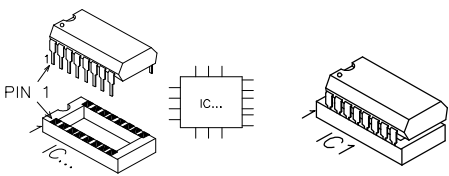


FIG 3.0

13. IC. Watch the position of the notch !



- ❑ IC1 : 3004

☞ Insert IC1, 3004 type into his socket with his notch towards the pcb edge.

14. Identification of the transmitter for the distinct receivers.

For use with the Pre-amplifier and tuner (K4100/K4500) :

- ❑ Fit a small signal diode for D3.

For use with the universal remote control (K6711) :

- ❑ Fit a small signal diode for D4.

For use with the distinct one-channel receivers :

- ❑ Fit one of the diodes D4 trough D7, see the directions for use of the one channel receiver (K6712).

15. Mounting the housing

1. Sticking the Keyboard :

- ❑ Remove the covers of the housing.
- ❑ Stick the keyboard onto the housing, with the connection lip in the saving, so that the LED window corresponds with the hole in the aluminium.

2. Mounting the pcb :

- ❑ Carefully push the pcb into the housing (fig.4.0)

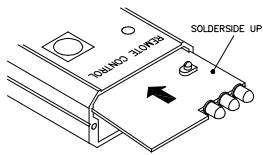


FIG 4.0

- ❑ Carefully insert the pcb cable of the keyboard into the connector. Pay attention to the position of the pcb (fig. 5.0).

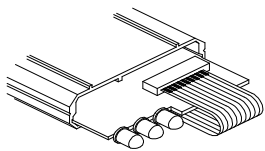


FIG 5.0

- ❑ Pay attention to the position of the three IR LED's and of the red indication LED!

- ❑ Run the battery holder from the opposite side trough the housing and fill up the room behind the pcb with the piece of foam-rubber supplied with the kit.

16. Test and Usage

- Connect a 9v battery to the holder and insert the battery into the housing. Test the transmitter-receiver combination and check all the functions. Fit both covers onto the housing.

Functions :

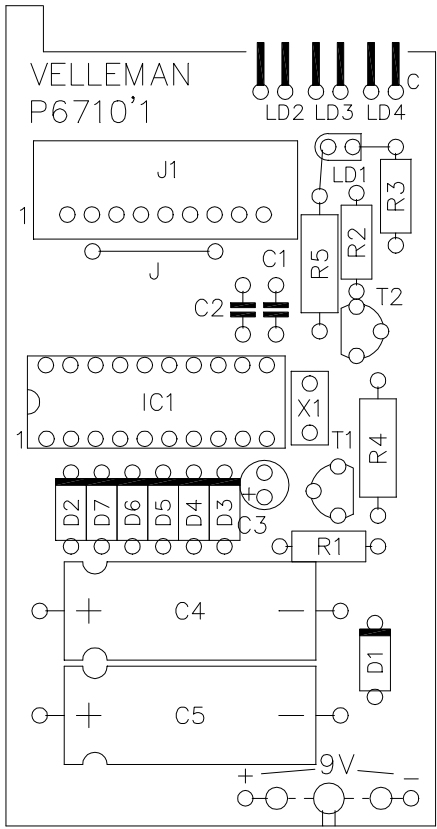
1. *<u>When using the kit together with the pre- amplifier/tuner :</u>*

- All functions are described in the user's manual of the preamplifier and of the tuner.
- To preserve the settings of the pre-amplifier or the preselections of the tuner, press the corresponding "MEM"-key together with the red safety key.

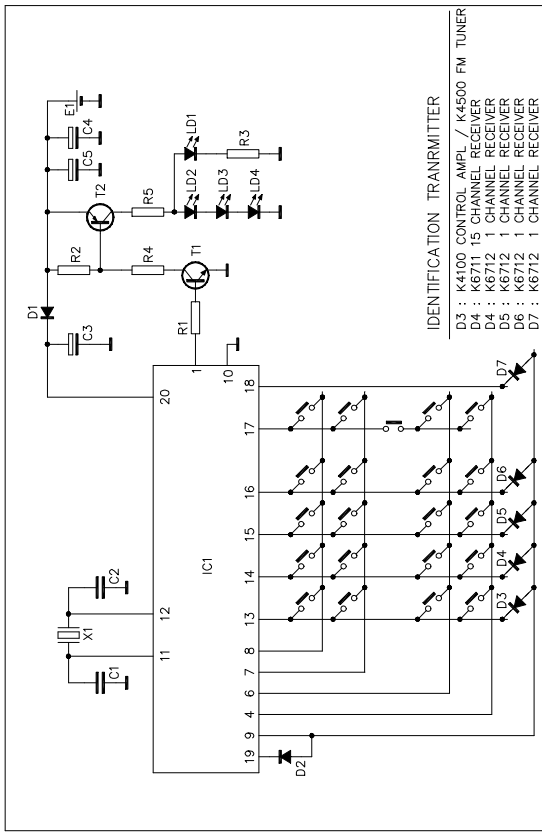
2. *<u>When using the kit together with the 15-channel or 1-channel receiver :</u>*

- Channel selection : keys 1 trough 15 (keys 1 trough 7 constitute group 1 and keys 8 trough 15 constitute group 2).
- Memory function : keys MEM1 or MEM2, to be pressed together with the red safety key STORE.
- To call the memories : CALL1 or CALL2.
- To reset all outputs : CLEAR key.

17. PCB Layout



18. Diagram


IDENTIFICATION TRANRMITTER
D3 : K4100 CONTROL AMPL / K4500 FM TUNER
D4 : K6711 15 CHANNEL RECEIVER
D4 : K6712 1 CHANNEL RECEIVER
D5 : K6712 1 CHANNEL RECEIVER
D6 : K6712 1 CHANNEL RECEIVER
D7 : K6712 1 CHANNEL RECEIVER
IC1
X1
C1
C2
C3
C4
C5
D1
D2
D3
D4
D5
D6
D7
E1
LD1
LD2
LD3
LD4
R1
R2
R3
R4
R5
T1
T2

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